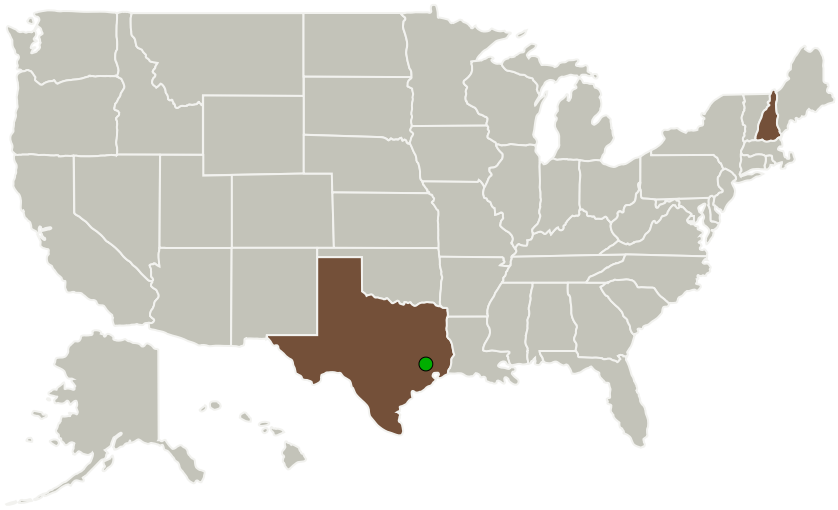
Compact, Efficient, and Reliable Ventilation Fan for EVA Suits, Phase II

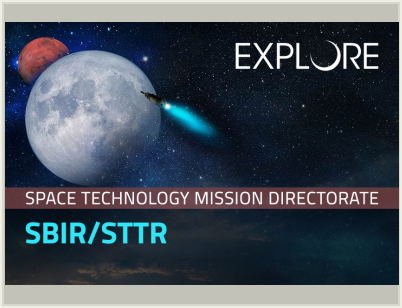
Completed Technology Project (2010 - 2012)

Project Introduction

Advanced EVA suits for space exploration will need a portable life support system (PLSS) that is compact, lightweight, highly reliable, and meets stringent requirements for oxygen safety. A key component is a blower that circulates gas through the space suit ventilation loop. We propose to develop an innovative blower that can meet the challenging requirements for circulating ventilation gas in an EVA suit using a reliable system that consumes little power. The innovative design enables use of a wide range of materials that can be selected to maximize safety in an oxygen environment. In Phase I we proved the feasibility of our approach by testing and optimizing blower components, producing a conceptual design for the blower and motor, and demonstrating a proof-of-concept blower under prototypical conditions. In Phase II we will optimize the blower and motor designs to achieve small size and maximum efficiency while meeting requirements and constraints for operation in exploration space suits. We will demonstrate lifetime and reliability of critical components in a prototypical oxygen environment and deliver a prototype blower that can be used in system tests of advanced portable life support systems.

Primary U.S. Work Locations and Key Partners





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Organizations Performing Work	Role	Type	Location
Creare LLC	Lead Organization	Industry	Hanover, New Hampshire
Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas

Primary U.S. Work Locations	
New Hampshire	Texas

Project Transitions

January 2010: Project Start

July 2012: Closed out

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Creare LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

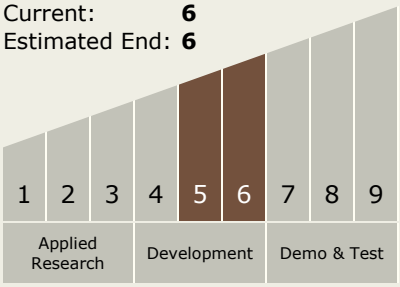
Carlos Torrez

Principal Investigator:

Michael G Izenson

Technology Maturity (TRL)

Start: **5**
Current: **6**
Estimated End: **6**



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Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.2 Extravehicular Activity Systems
    - TX06.2.2 Portable Life Support System

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System